مذكرة رقم : 083X24 19 فبراير 2024

إلى السيدات والسادة

مديرة ومديري الأكاديميات الجهوية للتربية والتكوين

المديرات والمديرين الإقليميين

المفتشات والمفتشين التربويين للتعليم الثانوي

مديرات ومديري الثانويات التأهيلية

أستاذات وأساتذة التعليم الثانوي التأهيلي

الموضوع : **الإطار المرجعي المكيف لاختبارات الامتحان الوطني الموحد للبكالوريا - 2024**

- مادة علوم الحياة والأرض: شعبة العلوم التجريبية مسلك العلوم الفيزيائية خيار أنجليزية -

المرجع : - قرار وزير التربية الوطنية والتعليم العالي وتكوين الأطر والبحث العلمي رقم 2385.06 بتاريخ 23 رمضان 1427 (16 أكتوبر 2006) في شأن تنظيم امتحانات نيل شهادة البكالوريا كما تم تغييره وتتميمه؛

- المذكرة الوزارية رقم 001X24 بتاريخ 02 يناير 2024 في شأن تكييف تنظيم السنة الدراسية 2023/2024

- المذكرة الوزارية رقم 086X24 بتاريخ 25 يناير 2024 في شأن الوثيقة المرجعية الخاصة بتكييف البرامج الدراسية

سلام تام بوجود مولانا الإمام،

وبعد، فإلحاقا بالمراجع المشار إليها أعلاه، ومواصلة للجهود الرامية إلى الرفع من جودة التعلمات المدرسية، وانسجاما مع التوجهات الهادفة إلى تحسين الممارسة التقويمية والرفع من مصداقيتها، عملت الوزارة على إعداد الإطار المرجعي **المكيف** للامتحان الوطني الموحد للبكالوريا الخاص بمادة **علوم الحياة والأرض شعبة العلوم التجريبية مسلك العلوم الفيزيائية خيار أنجليزية** لاعتماده في بناء مواضيع اختبارات المادة المذكورة بالامتحان.

وقد تم إعداد هذا الإطار المرجعي والمصادقة عليه من طرف لجن وطنية تخصصية بتمثيلية الأكاديميات الجهوية للتربية والتكوين.

1. الأهداف

وتتحدد الأهداف من اعتماد الأطر المرجعية في:

1.1. التحديد الأدق لما يجب أن يستهدفه الامتحان الوطني الموحد للبكالوريا من كفايات ومهارات ومضامين وذلك بهدف التوجيه الأنجع لتدخلات مختلف الفئات المعنية بإعداد المترشحين والمترشحات لاجتياز هذا الامتحان؛

2.1. الرفع من درجة صلاحية مواضيع الامتحانات الإشهادية بجعلها أكثر تغطية وتمثيلية للمنهاج الدراسي الرسمي؛

3.1. تدقيق الأساس التعاقدي للامتحان بالنسبة لجميع الأطراف المعنية من مدرسات ومدرسين وتلميذات وتلاميذ ولجن إعداد المواضيع؛

4.1. اعتماد معيار وطني موحد لتقويم مواضيع الامتحانات الإشهادية؛

5.1. توفير موجهات لبناء فروض المراقبة المستمرة واستثمار نتائجها في وضع الآليات الممكنة من ضمان تحكم المتعلمات والمتعلمين في الموارد والكفايات الأساسية للمناهج الدراسية.

2. بنية الإطار المرجعي

يستند وضع الأطر المرجعية لمواضيع الامتحانات الإشهادية على التحديد الدقيق والإجرائي لمعالم التحصيل النموذجي للمتعلمين وللمتعلمات عند نهاية السلك التعليمي وذلك من خلال:

2.1. ضبط الموارد الدراسية المقررة في السنة النهائية لسلك البكالوريا مع حصر درجة الأهمية النسبية لكل مجال من مجالاتها داخل المنهاج الرسمي لكل مادة دراسية؛

2.2. تعريف الكفايات والمهارات والقدرات المسطرة لهذا المستوى التعليمي تعريفا إجرائيا، مع تحديد درجة الأهمية بالنسبة لكل مستوى مهاري داخل المنهاج الرسمي للمادة الدراسية المعنية؛

3.2. تحديد شروط الإنجاز.

3. توظيف الإطار المرجعي

توظف الأطر المرجعية في بناء مواضيع الاختبارات المتعلقة بمختلف المواد المعنية بالامتحان وذلك بالاستناد إلى المعايير التالية:

1.3. **التغطية** : أن يغطي موضوع الامتحان كل المجالات المحددة في الإطار المرجعي الخاص بكل مادة دراسية.

2.3. **التمثيلية** : أن تعتمد درجة الأهمية المحددة في الإطار المرجعي لكل مجال من مجالات الموارد الدراسية ولكل كفاية أو مستوى مهاري في بناء موضوع الاختبار وذلك لضمان تمثيلية هذا الأخير للمنهاج الرسمي المقرر.

3.3. **المطابقة** : أن يتم التحقق من مطابقة الوضعيات الاختبارية للمحددات الواردة في الإطار المرجعي على ثلاث مستويات:

مديرية التقويم وتنظيم الحياة المدرسية والتكوينات المشتركة بين الأكاديميات
- المركز الوطني للتقويم والامتحانات
البريد الالكتروني: cne@men.gov.ma ☎ : 0537714453/52 📠 : 0537714437/08/09

- الكفايات والمهارات؛
- الموارد الدراسية ومجالاتها؛
- شروط الإنجاز.

هذا، وحتى يحقق هذا الإجراء الأهداف المتوخاة منه، باعتباره خطوة أساسية للرفع من صلاحية وموثوقية الامتحانات الإشهادية، يشرفني أن أطلب منكم الحرص على تنفيذ ما يلي:

- ✓ استنساخ هذه المذكرة وتوزيعها على المعنيين بالموضوع من مفتشات ومفتشين تربويين وأستاذات وأساتذة مع العمل على إطلاع مختلف المترشحين والمترشحات لامتحانات البكالوريا على فحواها؛
- ✓ تمكين السيدات والسادة المفتشات والمفتشين التربويين للمواد المعنية بالامتحان من عقد اجتماعات ولقاءات تربوية لإطلاع المتدخلين المعنيين على مضامين هذا الإطر المرجعي؛
- ✓ دعوة السيدات والسادة المفتشات والمفتشين التربويين إلى تنظيم لقاءات تربوية مع السيدات والسادة الأستاذات والأساتذة لاعتماد هذه الأداة في التخطيط للتدريس وتوظيفها في إعداد فروض المراقبة المستمرة.

واعتبارا للأهمية البالغة التي يكتسيها هذا الموضوع، فإني أهيب بالجميع، كل من موقعه، إيلاءه كل الاهتمام والعناية اللازمتين.

و السلام.

وزير التربية الوطنية والتعليم الأولي والرياضة

شكيب بنموسى

مديرية التقويم وتنظيم الحياة المدرسية والتكوينات المشتركة بين الأكاديميات
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المملكة المغربية
وزارة التربية الوطنية والتعليم الأولي والرياضة

الأطر المرجعية المكيفة الخاصة بالامتحان الوطني الموحد لنيل شهادة البكالوريا -2024 -

الإطار المرجعي لمادة علوم الحياة والأرض

شعبة العلوم التجريبية / مسلك العلوم الفيزيائية خيار إنجليزية

المركز الوطني للتقويم والامتحانات

2024

I. Areas of assessment:

1. The specific competences covered by the assessment:

According to the booklet of educational guidelines and programs specific to the teaching of life and earth sciences in qualifying secondary education, the skills targeted in the Physical Sciences option are:

- Acquire knowledge about the consumption of the organic matter and the flow of energy at the cellular level in order to understand the importance of energy in the cellular activity and raising awareness of its role in the support of the vital functions of the organism.
- To deepen knowledge on the nature of genetic information and the mechanisms of gene expression, with the purpose of using it to understand and explain the phenomenon of heredity among living beings;
- To acquire knowledge on the transmission of genetic information by the sexual reproduction and use this knowledge to solve some of the problems related to the transmission of hereditary characteristics.
- To acquire knowledge on the use of organic and inorganic matter and be aware of the danger of the pollutants caused by this use and propose environmental alternatives for preserving the safety of natural environments and the health of living beings.
- Use an appropriate scientific approach to address problems related to the consumption of organic matter, the flow of energy at the cellular level and related to genetics and the related to the use of organic and inorganic matter.
- Use the various modes of expression (oral, written and graphic) to communicate and represent phenomena related to the consumption of organic matter, energy flow within the cell and related to genetics and the related to the use of organic and inorganic matter.
- Correctly use laboratory equipment and information and communication technologies in the collection and processing of data relating to the consumption of organic matter and the flow of energy at the cell level, to genetics and the use of organic and inorganic materials.

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2. The content

2.1. Area 1: Consumption of organic matter and energy flows.

This area aims to complement the pupils' achievements related to the production of organic matter and energy flows through the knowledge of aspects of the consumption of organic matter and energy flows at the level of the cell. The objective is to bring the students to understand the mechanism of the use of organic matter by the living cell in order to supply energy that is necessary for its activity.

The study of reactions responsible for the release of the energy stored in organic matter in the cell:

- Be limited to essential reactions allowing ATP production during respiration and during fermentation;
- Determine the energy balance of these reactions.
- Know the cellular structures responsible for ATP production.
- Compare energy yield of respiration and fermentation.

The study of the role of the striated muscle skeletal in energy conversion consists of:

- Showing that the muscle cell is the structural and functional unit of muscle contraction through the study of the structure and the ultra-structure of this cell;
- Showing the relationship between the structure and the ultra-structure of the muscle cell on the one hand, and the mechanism of muscle contraction and the accompanying phenomena on the other;
- Highlighting the conversion of chemical energy (ATP) in mechanical energy during muscle contraction;
- Determining the different tracks for ATP regeneration in the muscle cell.

At the end of this field, it is necessary to build a diagram balance summarizing the relationships between the different reactions that release energy and those that consume it by emphasizing the role of the molecule of ATP as an energy intermediary.

2.2. Area 2: the nature of genetic information and the mechanism of its expression - transmission of genetic information in the course of sexual reproduction.

This field allows the learner to acquire knowledge about the nature of genetic information, its transmission of a cell mother to daughter cells, the mechanisms of its expression as well as its transmission during sexual reproduction.

- **The construction of the concept of genetic information is to:**
  - Highlight the location of genetic information in the cell of unicellular living beings and in multi-cellular living beings;
  - Determine the mechanism by which the genetic information is transmitted from one cell to another;
  - Build the concept of cell cycle from the study of the phases of the mitotic and inter-phase as well as the description of the behavior of chromosomes to deduce the notion of consistent reproduction;
  - Highlight the chemical nature of genetic information and determine the structure of the DNA and the mechanism of its replication with emphasis on the relationship between the evolution of the amount of DNA and that of chromosomes during the cell cycle;
  - Define the concepts of character, gene, allele, and mutation and establish the relationship character-protein and the relationship gene-protein, which allows to deepen the concepts of mutation and the gene and to build the concept of the genetic code;
  - Establish the relationship between genetic information and protein synthesis through the study of the mechanisms and stages of gene expression inside the cell: use of the genetic code to explain the expression of a gene (transcription and translation).

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- **To study the transmission of genetic information by sexual reproduction, it must show the role of meiosis and fertilization in the retention of the karyotype, and in the brewing and genetic diversity. For this, it is necessary to:**

  - Define the phenomenon of the meiosis, identify its different phases and show its role in the agitation of the alleles (mixing intra-chromosome and brewing inter-chromosomal) and therefore deduce the genetic diversity of gametes;
  - Define the phenomenon of fertilization and show its role in the genetic diversity of individuals of the same species;
  - Show the role of the meiosis and fertilization in the retention of the karyotype among individuals of the same species.

- **To study the statistical laws of the transmission of hereditary characteristics/traits in the diploids, it must:**
  - Build the concepts of genotype, pure lineage (wild and mutant) and hybridization;
  - Know the laws of Mendel and their exceptions through the study of examples of monohybridism that are not related to sex / autosomal (dominance and codominance, lethal gene) and those that are linked to the sex / heterosomal, and dihybridism (independent genes and inter-related genes);
  - Highlight the role of the crossing-over (crossover/linkage) in the genetic diversity of generations and in the establishment of the factorial card.

2.3. Area 3: The use of organic and inorganic matter

This area aims:

- **The study of garbage/household waste resulting from the use of organic materials consists of:**
  - Focus on the study of methods of their elimination and techniques of their treatment (sorting, recycling, and use in industry);
  - Deduce the impact of garbage on health, the environment, and the economy;
  - Raise learners' awareness of the dangers of garbage and develop positive and responsible attitudes in them toward their health and their environment.
- **The study of the use of organic and inorganic materials consists of:**
  - Raise the learners' awareness of the dangers of the various pollutants on the natural environments and their impact on health, the environment and the economy, with emphasis on the study of polluted areas in order to:
  - Get the learners to question the problems related to the pollution of the natural environments and its impact on health, the environment and the economy through the treatment of data, by analyzing and comparing the results of studies and research;
  - Bring the learners to come up within on polluting alternatives related to energy consumption and the use of organic and inorganic products in the industrial field;
  - Develop in the learners behaviors along with positive and accountable attitudes for the preservation of their health and their environment.

3. the semester distribution of the programs of the second year of the baccalaureate experimental sciences section physical sciences option

(Refer to the reference document regarding the adaptation of curriculum for the academic programs - Preparatory Secondary Education Track, issued by the Curriculum Directorate - January 2024).

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II. Organisation of notional and methodological areas.

1. Table of contents

Areas	Sub-areas	The knowledge	Basic objectives (notional/methodological)	Coverage (%)
1. Consumption of organic matter and energy flow	**1.1.** The reactions responsible for the release of the energy stored in the organic matter in the cell	- Concept of respiration; - Concept of fermentation; - The main phases of glycolysis; - Energy yield of glycolysis; - Mitochondrion structure and ultra-structure . - The main stages/phases of the Krebs cycle. - Energy yield of the Krebs cycle; - Electrons Transport Chain /ETC and oxidative phosphorylation - Energy yield of respiration. - The mainstages/phases of fermentation. - Energy yield of fermentation. - Energy efficiency.	- **Compare** respiration and fermentation through the analysis of data based on observation and experimentation/experiments/lab test. - **Show / highlight** the relationship between respiration, fermentation and the cellular structures involved through the use of data based on observation and experimentation. - **Apply** scientific reasoning (**formulate** a problem, **propose** and **test/ verify** a hypothesis, **propose** an experimental protocol…) on data related to respiration and fermentation. - **Deduce** the conditions of respiration and fermentation through the use of data based on observation and experimentation; - **Determine** the main stages of the reactions responsible for the release of the energy stored in organic matter, and **deduce** its energy yield. - **Describe** the components, the structure and ultra structure of the mitochondrion and relate them to the reactions of cellular respiration. - **Compare** the energy yield of respiration and fermentation. - **Calculate** energy efficiency of respiration and fermentation; - Graphically represent the aspects of respiration and fermentation; - **Draw up/make** a summary diagram of the energy yield of respiration and fermentation.	**35 %**

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Areas	Sub-areas	The knowledge	Basic objectives (notional / methodological)	Coverage (%)
1. Consumption of organic matter and energy flow	1.2. The role of the skeletal striated muscle in energy conversion	- Thermal and chemical phenomena (consumption of $O_2$and glucose…) concurrent to the muscle contraction. - Skeletal muscle structure and ultra-structure. - Molecular structure of the myofilaments - Origin of the energy necessary for the muscle contraction; - Muscle contraction mechanism. - Metabolic pathways of ATP regeneration .	- **Compare** the state of a muscle fiber at rest and during a contraction; - **Apply** scientific reasoning (**formulate** a problem, **propose** and **test/ verify** a hypothesis, **propose** an experimental protocol…) on data related to muscle contraction; - **Using** the structure and ultra-structure of the skeletal muscle cell in order to **explain** the mechanisms of muscle contraction. - **Determine** Thermal and chemical Phenomena concurrent to the muscle contraction; - **Show / highlight** the relationship between thermal and chemical phenomena and muscle contraction; - **Deduce** metabolic pathways for ATP regeneration required for muscle contraction; - **Show / highlight** the relationship between the pathways of ATP regeneration and the type of physical effort; - **Draw up/make** diagrams of muscle contraction mechanism.	
	1.3 Outcome: Diagram/flowchart of organic matter consumption and energy flow in the cell.	Pre-requisite knowledge in this domain.	- **Draw up** a flow chart of the consumption of organic matter and energy flow in the cell.	

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Areas	Sub-areas	The knowledge	Basic objectives (notional/methodological)	Coverage (%)
2. Nature of genetic information and the mechanism of its expression - Transmission of genetic information during sexual reproduction	2.1 Concept of genetic information	- The location of genetic information in the cell nucleus. - The role of chromosomes in the transmission of genetic information from cell to cell. o The mitosis phases in the animal cell; o Cell cycle. - The chemical nature of genetic material: o Composition and structure of chromosomes and DNA o mechanism of DNA Replication/Duplication. - The notions of inherited characteristics, gene, allele and mutation. - The relationship characteristic-protein and gene-protein; - The meaning of genetic mutation. The genetic code.	- **Deduce** the location of genetic information in the cell nucleus through **data analysis**. - **Describe** and **identify** mitosis phases. - **Construct** and **represent** the cell cycle and **deduce** its role in the stability of genetic information; - **Deduce** the role of chromosomes in the transmission of genetic information from cell to cell through **the use/exploitation** of observation and experimentation data. - **Determine** the chemical nature of genetic material through **the use/exploitation** of observation and experimentation data by **applying scientific reasoning** (**formulate** problem, **propose** and **test/ verify** a hypothesis, **propose** an experimental protocol…); - **Show/ highlight** the relationship between chromosomes and DNA molecule; - **Show/ highlight** the role of the DNA duplication in the stability of genetic information; - **Show/ highlight** the relationship characteristic-protein and gene-protein through **data exploitation**; - **Deduce** the meaning of genetic mutation by using genetic code. - **Draw up** graphic representation related to mitosis phases and to the chemical nature of genetic material.	**40%**
	2.2. Mechanism of the expression of genetic Information: Protein synthesis stages.	- RNA structure. - Transcription. - Translation (Initiation, elongation and termination).	- **Explain** the transcription mechanism of **mRNA** molecule; - **Show / highlight** the relationship between DNA, **mRNA** and protein by using genetic code (the meaning of the genetic code); - **Describe** the stages of protein synthesis ; - **Draw up a diagram** summarizing the stages of proteins synthesis.	

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Areas	Sub-areas	The knowledge	Basic objectives (notional/methodological)	Coverage (%)
2. Nature of genetic information and the mechanism of its expression - Transmission of genetic information during sexual reproduction	2.3. Transmission of genetic information during sexual reproduction.	- The meiosis phases; - Karyotypes of diploid species. - The role of meiosis and fertilization in the recombination of alleles (inter-chromosomic and intra-chromosomic mixing) and the karyotype stability (stability in the number of chromosomes) from generation to generation.	- **Describe** and **recognize** the meiosis phrases. - **Analyze** karyotypes of diploid species. - **Deduce** the role of meiosis and fertilization in the recombination of the alleles and the stability of karyotype in the same species from generation to generation and their role in genetic diversity through data observation and experimentation. - **Draw up**/Make diagrams related to the meiosis phases.	
	2.4. Statistical laws of the transmission of genetic characteristics in the diploids.	- Mendel's laws in the transmission of hereditary characteristics; - Monohybridisme and dihybridisme (independent genes and inter-related genes); - Pure lineage and hybrids, homozygosity and heterozygosity, hybridization, crossing-test (test -Cross/ back/cross) - Punnett square/combinations grid - Dominance and co-dominance; - The lethal gene; - Sex-linked and non sex-linked inheritance - Crossover (crossing-over), intrachromosomal mixing; and genetic diversity - The genetic-linkage map.	- **Analyze** and **interpret** the results of the transmission of a couple of alleles through the study of a specific example (in the case of a sex-linked gene and in the case of a non-sex-linked gene/autosomal gene). - **Analyze** and **interpret** the results of the transmission of two couples of alleles through the study of a specific example (in the case of two independent genes and two linked -genes) - **Draw up a diagram of** genetic inter-chromosomic and intra-chromosomic mixing, according to the example studied; - **Calculate** the distance between genes and **sketch** the genetic-linkage map.	

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Areas	Sub-areas	The knowledge	Basic objectives (notional/methodological)	Coverage (%)
3: **Use of organic and inorganic materials**	**3.1**. Household Waste resulting from the use of organic matter	- Household waste and its nature; - Household waste disposal and its treatment: sorting, recycling, composting, methanisation and incineration; - The impact of waste on the environment, health and the economy.	- **Formulate a problem** related to waste; - **Deduce** the characteristics of household waste; - **Determine** the means of waste disposal; - **Exploit data** related to the management of the household waste; - **Show/ highlight the importance** of recycling and treating household waste in economic and ecological environment; - **Show/ highlight** the negative impact of waste on the environment and the economy; - **Show/ highlight** the positive effect of household waste manàgement on the environment and the economy; - **Propose measures** to reduce the negative effects of household waste on health and the environment.	**25 %**
	3.2. The pollution due to the consumption of energy matter and the use of organic and inorganic matter in the chemical, food and mineral industries,	- Pollutants and polluted environments; - The impact of pollutants on the environment, health and the economy; - The alternatives.	- **Propose a problem** related to the pollution **and formulate hypotheses;** - **Exploit data** related to polluting agents and to the pollution of natural environment; - **Apply scientific reasoning** to solve a problem related to the pollution of natural environments**;** - **Show the** negative implications/hazards of pollutants on health, the environment and the economy; - **Express** opinion on the use of certain pollutants; - **Propose measures** to reduce the negative effects of pollutants on health, the environment and the economy.	

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2. Skills Table.

Skills areas	Skills	Weighting in (%)
Knowledge Retrieval	This Section, knowledge retrieval, aims to assess the degree of mastery of content using the following: - Multiple choice questions (MCQ). - True/false statements. - Matching. - Short-answer questions (give definitions, label a diagram or a graph, and know theories, laws, scientific terms, facts, signs, etc.).	**25%**
Scientific reasoning and communication in graphic and written modes.	This Section, **scientific reasoning and communication in graphic and written modes, aims** to assess the degree of mastery of skills and competencies: - **Determine** and **formulate** a scientific problem; - **Use** background knowledge, **select** and **organise** information in relation to the subject of study; - **Link** information with acquired knowledge to resolve a scientific problem; - **Make/formulate** a hypothesis in relation to a scientific problem; - **Use knowledge** to solve a scientific probleprogrm or to **explain** the phenomena under study; - **Suggest** appropriate tools to **test** hypotheses; - **Describe** and **analyze** scientific data; - **Compare** and **explain/interpret** results; - **Infer** and **generalise the results**; - **Use** principles, laws, models to **explain/interpret** scientific phenomena and data; - **Conduct a synthesis** of information and data and turn it into a text or a diagram; - **Give** an opinion and support it with arguments. - **Present** a structure or biological and geological phenomena using a diagram; - **Turn** numerical data into a chart, a graph or a text; - **Draw** a functional diagram; - **Achieve/realise** a synthetic flowchart.	**75%**

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3. Specification table (summary table: knowledge/skills)

The organization of the specification table is made according to ministerial note n° 10-142 relating to educational evaluation of life and earth sciences in qualifying secondary education which organizes the constituents of the national examination into two parts (part I linked to the restitution of knowledge and part II linked to the use and mobilization of data, knowledge and skills according to an adequate scientific approach), and taking into account the hourly importance of each area in the program to establish the percentages and distribute the points.

Part I: Restitution of knowledge, the questions in this part deal with the main areas of knowledge which make it possible to assess the main knowledge. This part allows the learner to be assessed in the three main areas.

Part II: Exploitation of data and mobilization of acquired knowledge according to a scientific approach (scientific reasoning and graphic and written .communication). This part allows the learner to be assessed in the three main areas

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Knowledge areas (Areas and Sub-areas) / Skills		Restitution of knowledge (25%)	Scientific reasoning and graphic and written communication 75%	Total (%)	Scores assigned to each area
1. Consumption of organic matter and energy flow	The reactions responsible for the release of energy contained in organic matter at the cellular level The role of skeletal muscle in energy transfer Outcome: Diagram/flowchart of organic matter consumption and energy flow in the cell.	**10% (2 pts)**	**25 % (5 pts)**	**35 %**	**7 pts**
2. Nature of genetic information and the mechanism of its expression - Transmission of genetic information during sexual reproduction	Concept of genetic information Mechanism of the expression of genetic Information: Protein synthesis stages. Transmission of genetic information during sexual reproduction. Statistical laws of the transmission of genetic characteristics in the diploids.	**10% (2 pts)**	**30 % (6 pts)**	**40%**	**8 pts**
3. Use of organic and inorganic materials.	Household Waste resulting from the use of organic matter The pollution due to the consumption of energy matter and the use of organic and inorganic matter in the chemical, food and mineral industries;	**5% (1 pts)**	**20 % (4 pts)**	**25 %**	**5 pts**
Total (%)		**25%**	**75%**	**100%**	**20 pts**
Scores assigned to each part		**5 pts**	**15 pts**		

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III. Organization of the national baccalaureate examination subject

<table>
<tr><th colspan="3">The structure of the subject</th></tr>
<tr><td colspan="3">Part I: restitution of knowledge

This Section, knowledge retrieval, aims to assess the degree of mastery of content using the following:
- Multiple choice questions (MCQ).
- True/false statements.
- Matching.
- Classification/ seriation/ rearranging
- Short-answer questions (give definitions, label a diagram or a graph, and know theories, laws, scientific terms, facts, signs, etc.).</td></tr>
<tr><td colspan="2">This part can be organized to cover the three main areas:</td><td>Scoring</td></tr>
<tr><td colspan="2">1. Consumption of organic matter and energy flow.</td><td>2pts</td></tr>
<tr><td colspan="2">2. Nature of genetic information and the mechanism of its expression - Transmission of genetic information during sexual reproduction.</td><td>2pts</td></tr>
<tr><td colspan="2">3. Use of organic and inorganic materials.</td><td>1pt</td></tr>
<tr><td colspan="3">Part II: Scientific reasoning and written and graphic communication</td></tr>
<tr><td rowspan="3">It consists of 3 exercises</td><td>Exercise1: Consumption of organic matter and energy flow</td><td>5 pts</td></tr>
<tr><td>Exercise 2 : Nature of genetic information and the mechanism of its expression - Transmission of genetic information during sexual reproduction</td><td>6 pts</td></tr>
<tr><td>Exercise 3 : Use of organic and inorganic materials.</td><td>4 pts</td></tr>
</table>

IV. The materials needed to take the exam:

In addition to the identity card and the invitation, the candidate must bring the following material:

- **Writing and drawing materials: pens, pencils, a ruler, an eraser and a pencil sharpener;**
- **A non-programmable calculator;**
- **Graph paper.**

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